

Claims

- [c1] 1. An integrated circuit having a plurality of circuits that include at least one I/O circuit and at least one logic circuit, comprising:
- a) a contact layer having a plurality of contacts for electrically connecting the integrated circuit to packaging;
 - b) a power grid comprising a plurality of metal layers for providing power to the at least one I/O circuit and the at least one logic circuit;
 - c) a semiconductor device layer in electrical communication with said power grid; and
 - d) a wiring layer interposed between said contact layer and said power grid and electrically connecting said plurality of contacts with said power grid, said wiring layer including a plurality of wires each having a length extending partly along a first direction and partly along a second direction different from said first direction.
- [c2] 2. An integrated circuit according to claim 1, wherein each of at least some of said plurality of wires have a ring-shaped configuration
- [c3] 3. An integrated circuit according to claim 2, wherein said ring-shaped configuration is rectangular.

- [c4] 4. An integrated circuit according to claim 2, wherein at least some of said ones of said plurality of wires having said ring-shaped configuration are arranged concentrically with one another.
- [c5] 5. An integrated circuit according to claim 1, wherein said plurality of contacts includes a plurality of first contacts and a plurality of second contacts located alternately with respect to said plurality of first contacts along a plurality of lines, said wiring layer including a plurality of first wires and a plurality of second wires wherein each of said plurality of second wires is laterally spaced from a corresponding one of said plurality of first wires, and each of said plurality of first wires is located on one side of a corresponding one of said plurality of lines and a corresponding one of said plurality of second wires is located on the opposite side of said corresponding one of said plurality of lines.
- [c6] 6. An integrated circuit according to claim 1, wherein said plurality of wires are arranged in concentric rings.
- [c7] 7. An integrated circuit according to claim 1, wherein said plurality of wires includes a plurality of Vdd wires and a plurality of ground wires.
- [c8] 8. An integrated circuit according to claim 7, further

comprising a plurality of Vddx wires.

- [c9] 9. An integrated circuit according to claim 1, wherein said plurality of contacts are arranged in a square pattern having diagonal symmetry and major axis symmetry, said plurality of wires arranged in concentric square rings.
- [c10] 10 .An integrated circuit having a plurality of circuits that include at least one I/O circuit and at least one logic circuit, comprising:
- a) a contact layer having a plurality of contacts for electrically connecting the integrated circuit to packaging;
 - b) a power grid comprising a plurality of metal layers for providing power to the at least one I/O circuit and the at least one logic circuit;
 - c) a semiconductor device layer in electrical communication with said power grid; and
 - d) a wiring layer interposed between, and electrically connecting together, said contact layer and said power grid, said wiring layer including a plurality of wires having ring-shaped configurations.
- [c11] 11. An integrated circuit according to claim 10, wherein said ring-shaped configurations are rectangular.
- [c12] 12. An integrated circuit according to claim 10, wherein

at least some of said ones of said plurality of wires having said ring-shaped configurations are arranged concentrically with one another.

- [c13] 13. An integrated circuit according to claim 10, wherein said plurality of contacts includes a plurality of first contacts and a plurality of second contacts located alternately with respect to said plurality of first contacts along a plurality of lines, said wiring layer including a plurality of first wires and a plurality of second wires wherein each of said plurality of second wires is laterally spaced from a corresponding one of said plurality of first wires, and each of said plurality of first wires is located on one side of a corresponding one of said plurality of lines and a corresponding one of said plurality of second wires is located on the opposite side of said corresponding one of said plurality of lines.
- [c14] 14. An integrated circuit according to claim 10, wherein said plurality of wires includes a plurality of Vdd wires and a plurality of ground wires.
- [c15] 15. An integrated circuit according to claim 15, further comprising a plurality of Vddx wires.
- [c16] 16. An integrated circuit according to claim 10, wherein said plurality of contacts are arranged in a square pat-

tern having diagonal symmetry and major axis symmetry, said plurality of wires arranged in concentric square rings.

[c17] 17. An integrated circuit according to claim 10, wherein said power grid comprises a plurality of layers each comprising wires having longitudinal axes all extending in the same direction.

[c18] 18. A device, comprising:

- a) a power supply; and
- b) an integrated circuit having at least one I/O circuit and at least one logic circuit, said integrated circuit comprising:
 - i) a contact layer having a plurality of contacts in electrical communication with said power supply;
 - ii) a power grid comprising a plurality of metal layers for providing power to said at least one I/O circuit and said at least one logic circuit;
 - iii) a semiconductor device layer in electrical communication with said power grid; and
 - iv) a wiring layer interposed between said contact layer and said power grid and electrically connecting at least some of said contacts with said power grid, said wiring layer including a plurality of wires each having a length extending partly along a first direction and partly along a second direction different from said first direction.

[c19] 19. A device according to claim 18, wherein each of at least some of said plurality of wires have a ring-shaped configuration.

[c20] 20. A device according to claim 18, wherein said plurality of wires are configured and arranged in concentric rings.